

# PHONETIC TRANSCRIPTION AND TRANSLITERATION

PROPOSALS OF THE  
COPENHAGEN CONFERENCE

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Sections 1-28 have been drawn up  
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### PHONETIC TRANSCRIPTION AND TRANSLITERATION

#### 1. *History and Composition of the Conference*

SCHOLARS have often felt the desirability of having one single system of phonetic transcription and of transliteration of foreign alphabets instead of the prevailing chaos, in which each phonetician thinks himself justified in using his own personal system, many writers even using different systems at different periods of their lives. This is not the place to give an account of the various systems used hitherto, or of the various attempts at solving the problem ; it may be sufficient briefly to refer to such essentially different solutions as those contained in Lepsius's *Standard Alphabet*, Sweet's *Sound Notation* (reprinted in *Collected Papers*), Jespersen's chapter 'Lautschrift' in *Phonetische Grundfragen*, W. Perrett's *Peetickay*, and V. Forchhammer's 'Weltlautschrift' in *Die Grundlage der Phonetik*, not to forget the activity of the Association Phonétique Internationale under the directorship of Paul Passy, assisted (since 1907) by Daniel Jones.

In 1922 the question of phonetic transcription and of transliteration was brought before the meeting of the Union Académique Internationale in Brussels by Jespersen and Salverda de Grave, who thought that this union of learned societies in many countries might perhaps be instrumental in bringing about some unity in these matters. At the meeting of the same body in 1923 Rozwadowski and van Wijk were charged with the preliminary preparations, and they subsequently, in 1924, sent out a circular letter to about one hundred scholars in various countries, asking their opinions as to which of the existing systems seemed to them the best, and as to the best way of getting out of the present unsatisfactory

state of things in this matter. Unfortunately, however, the answers received were so widely divergent and partly so indefinite that nothing could be built on them.

At the meeting in May 1924 it was therefore agreed that it would be a good thing if a not too numerous body of competent scholars, representing as many different groups of languages as possible, could meet together personally and discuss the problems thoroughly *viva voce*, in order, if possible, to arrive at some unity system of transcription and transliteration. The meeting, it was thought, should take place in a neutral country. Fortunately, the Danish Rask-Ørsted Fund for the promotion of international scientific co-operation granted a sum sufficient to pay hotel expenses and the greater part of the travelling expenses for those members of the Conference who were not residents of Copenhagen. A list of scholars to be invited was drawn up by Jespersen and Holger Pedersen under the active co-operation of Meillet and Olaf Broch, the selection being made not according to the nationality of the scholars, but according to their special competence, so as to have the principal groups of languages (Indo-European, Semitic, African, Far-Eastern, American) represented as well and as fully as circumstances allowed.

Fortunately nearly all the scholars invited were able to come to Copenhagen, the only exceptions being Professor Streitberg of Leipzig, whose health did not allow his travelling, and Professor Meillet of Paris, who had at first promised to come and who throughout had shown the greatest interest in our plans, but who was ultimately prevented from attending. In their stead we had the pleasure of seeing Professors Sommer and Vendryes.

Before the meeting of the Conference two lists were sent out to the members, one prepared by Jespersen and giving a synopsis of the phonetic transcriptions of the Association Phonétique Internationale, of the Swedish and Danish Dialect Reviews, of Lepsius, of the French Dialectologists, and of the American Anthropological Association, and another prepared by Holger Pedersen and giving the principal signs of the best-known systems of transliteration. Professor Daniel Jones

had kindly sent a number of pamphlets and books showing the application of the system of the Association to a variety of languages.

The following scholars were members of the Conférence and were present at all the meetings:

Olaf Broch, Professor in the University of Oslo, author of *Slavische Phonetik*, &c.

Carl Brockelmann, Professor in the University of Breslau, author of *Grundriss der vergleichenden Grammatik der semitischen Sprachen*, &c.

Otto Jespersen, Professor in the University of Copenhagen, author of *Lehrbuch der Phonetik*, &c.

Daniel Jones, Professor in University College, London, author of *English Phonetics*, &c.

Bernhard Karlgren, Professor in the University of Göteborg, author of *Études sur la Phonologie chinoise*, &c.

Carl Meinhof, Professor in the University of Hamburg, author of *Grundriss einer Lautlehre der Bantusprachen*, &c.

Holger Pedersen, Professor in the University of Copenhagen, author of *Vergleichende Grammatik der keltischen Sprachen*, &c.

Jan Rozwadowski, Professor in the University of Kraków, author of *Historical Phonetics of the Polish Language*, &c.

Ferdinand Sommer, Professor in the University of Bonn, author of *Handbuch der lateinischen Laut- und Formenlehre*, &c.

William Thalbitzer, lecturer in the University of Copenhagen, author of *A Phonetical Study of the Eskimo Language*, &c.

N. van Wijk, Professor in the University of Leiden, author of *Die baltischen und slavischen Akzent- und Intonationssysteme*, &c.

J. Vendryes, Professor in the University of Paris, author of *Le Langage*, &c.

At most of the meetings Mr. Blessing Dahle, a Norwegian missionary native of Zululand, was present and was able to give most welcome information about Zulu sounds.

The meetings were held in the University of Copenhagen from the 20th till the 25th of April 1925, each day from 9.30 or 10 a.m. till 1 p.m. and from 2 p.m. till 3 or 3.30 p.m.

The following report does not give the discussions themselves, but aims only at presenting in a systematic order the results arrived at.

## 2. *Task of the Conference*

The task of the Conference was purely scientific. It did not aim at devising alphabets to render it possible for natives of various uncivilized countries to write down their own languages in a practical way; still less, of course, to influence the spellings of languages already provided with a received orthography. Nor could it be our task to give advice as to the most practical notation to be used in schools for teaching foreign languages. It is hoped, however, that in course of time, when the Copenhagen system of transcription has been adopted in scientific descriptions of various languages and dialects, it will influence the way in which new native languages will be written down for practical purposes, thus rendering possible more exact and more uniform notations than many of those used up to now, in which it is very often possible to trace habits of denoting sounds which are peculiar to the European nation most influential as a colonizing power in the part of the world concerned (English, Dutch, &c.).

The Conference also deemed it outside of its province to give prescriptions for the way in which, for instance, Russian proper names should be transcribed popularly, in newspapers, translations of novels, histories, &c. Here each nation generally follows its own idiosyncrasies, and the same name thus figures in Italian newspapers as *Cicerin*, in French as *Tchitchérine*, in English as *Chicherin*, in Danish sometimes as *Tsjit-sjerin* or *Tjitjerin*, &c. It is possible mathematically to calculate in how many ways the simple name of the Russian writer *Chekhov* may be written, for the initial sound (sound-group) is rendered according to circumstances as *Ch*, *Tch*, *C*, *Tsch*, *Tsj*, *Tj*, *Cz*, *Č*, the middle consonant as *ch*, *kh*, *h*, *k*, *x*,



and the final sound as *v*, *f*, or *ff*. It would certainly at the present moment be impracticable to attempt influencing the general public in various countries in such matters, and things must, therefore, be left in the present chaotic condition until the knowledge of the fundamental principles of phonetic science has spread in wide circles.

The task of the Conference was twofold. It had to provide a system of phonetic transcription of the sounds actually occurring in any language or dialect to be described scientifically without any regard to the way in which such languages or dialects may have been hitherto written down; and then, on the other hand, to indicate the best way in which Oriental and other alphabets should be transliterated in Roman type, without any regard to the manner in which words are actually pronounced in the languages concerned. It is obvious that this really constitutes two different problems, for in consequence of the original deficiencies of all alphabets, as well as of subsequent historical developments, the same letter in some ancient or modern script may very well stand for more than one sound, and yet we must have a means of transliterating it everywhere in the same way, both where we have reliable information as to its actual pronunciation and where that is excluded by the nature of the case.

Nevertheless, though thus transcription and transliteration are necessarily two different things, they must be harmonized as far as practically possible. If the same sign is used in the two spheres, this should be done in such a way as not to create wrong impressions: thus, if in phonetic transcription a dot under a letter is used to denote retroflex articulation (§ 15), the same dot should not be used in other meanings (aspiration, syllabic function, emphatic pronunciation) in transliterating foreign alphabets; similarly in other cases, where previous systems have often sinned from want of foresight or of knowledge.

With regard to both transcription and transliteration the members of the Conference were conscious that they could do no more than give advice to the learned world: they have no means of enforcing their systems on anybody, but they hope

that the reasons given below for the selection of signs will seem convincing in most cases, and that, even where this is not the case, future phoneticians and transliterators will in the interests of unity adopt the signs here recommended, wherever it is typographically possible.

As for the terms used below in the phonetic sections, it is worth stating expressly at the outset that they should be everywhere understood as purely descriptive of sounds as actually produced, and not as implying any definite historical development. If, therefore, a sound is spoken of as palatalized, this refers exclusively to the physiological way of pronouncing it and does not imply that it has been historically developed from a non-palatalized sound through a process of palatalization. An 'advanced [a]' means simply an [a] articulated more forward, nearer to the teeth and lips, than the ordinary [a], but this may historically be the result of a retraction from a still more forward sound, just as in speaking of a voiced sound there is no implication that the sound has at any previous time been voiceless.

### 3. *What to Denote*

It is a simple consequence of the multiplicity of human speech sounds, and the infinite variety in which they occur in all the languages of the earth, that it is quite impossible to provide separate signs for all possible nuances of sounds. One must always be prepared for the possibility, in dealing with a new language or dialect, of coming across sounds or shades of sounds or combinations of sounds which have never before been described, and any system of phonetic transcription that is meant to be general must therefore provide for extensions in various directions. In other words, our system must have a certain elasticity.

In this connexion it will be well to mention the distinction first made by Sweet between a 'narrow' and a 'broad' notation: in the former a great many nuances are indicated as exactly as possible; in the latter many nuances are left out so as to make the writing and printing and reading as easy as

possible; this can to a great extent be done without injuring the scientific value of the transcription, because there are in each language many things which can be implied in a broader notation as following from the whole phonetic structure of the language: they need, therefore, only be stated once for all in the introductory remarks. Thus the same letter [t] may be used in French and in English though the sounds denoted are really different, in French unaspirated, in English aspirated, and in French formed with the tip of the tongue more forward than in English. It is unnecessary in connected specimens of either language to remind the reader of such general characteristics of the sounds each time these occur.

This naturally leads us to a distinction to which Daniel Jones more than any one else has drawn attention, the distinction between 'sounds' and 'phonemes'. A phoneme is defined as a family of sounds which from an objective point of view may be regarded as distinct, but which are felt naturally by the speakers of a certain language as identical, because they are not used to keep words apart. Thus it may be said that in English the [k] of *key* and the [k] of *car* are two different sounds, as they are formed in different points of the palate, but they are members of the same phoneme, because the different formation is never used with distinctive value, but follows automatically from the character of the vowel to be pronounced after the consonant. A non-syllabic [ɹ] and a consonant [j] formed with strong friction at approximately the same place in the mouth are certainly different sounds, which it requires only a little practice to hear as such, but there are probably very few languages which would use them as two phonemes serving to keep otherwise identical words distinct from one another. Distinctions which in one language are of great importance and which cannot there be disregarded without seriously impeding the intelligibility of words and sentences (distinctions of tone, for instance, or of quantity of vowels or consonants) may in another language be considered as non-existent: while, therefore, in the former language they must be always carefully indicated, it would be absurd to mark them in the latter.

Such considerations as these should be constantly borne in mind in judging the transcriptions proposed in the following pages.

#### 4. *What Signs to Employ*

The Copenhagen Conference took it for granted that the basis of the system to be recommended must be the ordinary Latin alphabet, and not systems like Bell's (or Sweet's) 'Visible Speech'. But how to supplement the obvious deficiencies of the Latin alphabet? It is not difficult to devise supplementary signs which can be easily written by means of pen or pencil, but when it comes to printing them difficulties arise which have to be taken into account. These typographical difficulties were felt so strongly by A. J. Ellis (who had in his youth, together with Isaac Pitman, experimented a good deal with modifications of Latin letters) that in his 'Palaeotype' system, employed in his great work on *Early English Pronunciation* (London, 1869 ff.), he refrained from using any sign that was not found in ordinary printing-offices, making extensive use of such devices as small capitals, italics, letters turned upside down, &c., and in many cases having recourse to digraphs or even trigraphs like [nhw] for single sounds. Similar principles, only with the exclusion of digraphs, were carried out in the elaborate system of the Swedish phonetician F. Wulff (in *Huitième Congrès des Orientalistes*, 1889, and other publications), in which Greek letters turned upside down, sometimes with the most unexpected values, and other similar devices are most ingeniously employed, but with the same general result as with Ellis's system, that the effect on the eye is most unpleasant, and that it is extremely difficult to remember the value in which each sign is used. It seems, therefore, now to be the universal impression among phoneticians, that the advantage of not having to cut and found new types is bought too dearly in such systems, and that it is necessary to some extent to have new types, which will have to be specially cut for those printing-offices which want to print works on phonetics. Only it is necessary to have regard to the cost of having such new types cast, and their number

accordingly should be reduced as much as is consistent with the purpose for which the alphabet is destined.

With regard to the extension of the Latin alphabet there may be said to be two different schools, both of which were represented at the Conference: their methods will here for shortness sake be designated as A and B.

The adherents of A prefer what might be called *monotypes*, letters so devised that they look as one undivided whole and can as a rule be written as such without lifting the pen from the paper. This principle is carried out with greatest consistency in J. A. Lundell's Swedish dialect alphabet (*Landsmålsalfabet*), which has been used for a variety of other languages than Swedish, among others by Buergel Goodwin and B. Karlgren. Another alphabet of the monotype class is the well-known one used by the Association Phonétique Internationale (Ass. Ph.), which is less systematic than Lundell's, but whose letters are more similar to ordinary letters than the composite types used by Lundell.

The adherents of B make an extensive use of *diacritical* marks (dots, strokes, circles) above or below the ordinary letters, the resulting phonetic signs being thus built up in two or even three stories seemingly independent of one another. One of the best-known systems of this type is Lepsius's *Standard Alphabet*, which has been extensively used even in quite recent times (though with some extensions and modifications) by C. Meinhof and other students of non-European languages, but less frequently in transcriptions of European languages.

The Conference did not decide one-sidedly in favour of one or the other of these rival systems, but chose in an eclectic spirit for some sounds a monotype notation (A), for other sounds diacritical marks (B), giving even in some cases preference to neither system, but allowing signs of both to be used as alternatives, so as to leave the decision to the individual taste of each scholar or to the resources of his printer.

### 5. *General Principles*

One of the main objects of the Conference was to do away with the worst of those ambiguities which are caused by the same sign being used for totally different purposes by various scholars. In such cases the ambiguous sign should either be totally discarded, or else, if it is retained, its meaning should be settled unambiguously, so that any other use of the sign should be discountenanced.

One example is a small circle under a letter, e.g. [n̥]: this is used extensively by comparative philologists to denote syllabic function, but by the Ass. Ph. to denote what is practically the very opposite, namely voicelessness. If, therefore, we see a word transcribed [vat̥n̥], it is impossible at once to know whether the last sound is to be pronounced voiced and syllabic, or voiceless and non-syllabic—as a matter of fact, the former is the Swedish, and the latter the Icelandic, form of what is etymologically the same word, meaning 'water'. Here the Conference decided in favour of the former value of the circle under a letter (§ 10). Other signs of double employment, with regard to which it was important to arrive at an agreement, are [n'], [n''], and [n̈], see below. One of the worst offenders in this respect is the letter [c], which has been used in transcriptions and transliterations for many different purposes: it was therefore thought advisable to discard this letter altogether from our phonetic system.

Another difficult letter is [y], which is used now for the round front vowel in Fr. *bu*, now for the not-round central Russian vowel in *ty* [ты], now for the consonant in E. *young*, &c. This consonant in other systems is denoted by the letter [j], but that letter, on the other hand, is used by some to denote the initial sound in Fr. *jamais*, and by others the initial sound-group in E. *jam*. The ambiguity of [j] may be to some extent obviated if we follow Lundell and write the letter without the dot, thus [j̣]. Now it is evident that those who use the letter [y] for the consonant cannot at the same time have it as a vowel, hence there is a certain interdependence between various signs, as seen in the following table, in

which the first column shows the system of the Ass. Ph., the second that of the French dialectologists, who use the letter [u] for the vowel in Fr. *bu*, and have therefore been obliged to coin a new letter for the vowel in Fr. *tout*; the third column shows how it is possible to avoid all ambiguity caused by the letters [y, j]:

E. <i>young</i>	.	.	.	j	y	ï, j
Fr. <i>bu</i>	.	.	.	y	u	ü
Fr. <i>tout</i>	.	.	.	u	u	u

The signs selected should as far as possible form a consistent system, the same modifications or diacritics being used everywhere with the same signification. It is difficult to carry this principle through to the fullest extent, on account of the unsystematic character of the basis itself, the Latin alphabet; and one member of the Conference, Daniel Jones, held the opinion that for some purposes, at any rate, it was preferable that the signs should be unsystematic, as long as they were easily written and looked well when printed: thus he preferred the signs of the Ass. Ph. [c, j] to the more systematic symbols preferred by the rest of the Conference, see § 16.

Phonetic signs should be as easy to remember as possible. This is to a great extent effected if they form a consistent system; but even apart from the greater ease of remembering systematic signs it is possible within certain limits to devise signs which by their very shape suggest the sound or modification of sound which they are meant to stand for. Examples will be found in some of the following paragraphs.

Practical considerations very often played a role in the deliberations of the Conference; thus when it was thought unwise to deviate too much from what scholars, whether students of Indo-European or other languages, were already accustomed to seeing and employing, and when, on the other hand, regard was often taken to what would be practical from the point of view of printers. These object to having too many signs over and under letters, as letters with such diacritics will in general have to be cast as so many separate letters, and thus present practically the same difficulties as new 'mono-

types', even if they may perhaps be written more easily. Semitists complain that very often the dots and strokes used in their transcriptions tend to disappear in printing, even where they have been clearly visible in the last proof. Therefore the Conference advocate the indication of such things as quantity and stress by means of symbols to be placed by the side of the sound symbols instead of above or below the letters.

On the contrary, the majority of the Conference thought it of minor importance to devise signs which would look pleasing and harmonious in printed connected texts: this consideration may to a great extent be left to the type-founders, while it was our business to create something which could be safely recommended from a scientific point of view.

#### *6. Transcription and Transliteration*

It was recommended to distinguish phonetic transcription from transliteration by inserting the former in square brackets [ ] and the latter in round parentheses with a small circle ( ¢ ), thus leaving the common round parentheses ( ) for the ordinary use to denote what may or may not be left out. Words or single letters from the ordinary spelling should be printed in italics ('kursiv').

The following paragraphs 7-28 deal exclusively with Transcription.

#### *7. Quantity*

The Conference recommend to place the sign for length *after* the sign for the sound itself, and to use the following signs for the various degrees of quantity :

[a˙] for long,

[a.] for half-long,

leaving short unmarked. Extra-long may be denoted [a˙˙].

This method of marking length is preferable to placing signs like [ː] and [ˑ] above the letters, as these signs easily come into collision with other signs placed above letters to indicate shades of sounds. There is this advantage in making signs for quantity independent of the sound symbols themselves, that it allows of greater freedom in the shaping of these,



whether monotypes or letters with diacritics be preferred. Moreover, it is easy to indicate wavering or uncertain length, as in *G. glas* [gla(·)s].

It seemed preferable to use [·] as in Jespersen's books instead of [:], which has been used hitherto by the Ass. Ph.; the latter is sometimes printed in such a way that it may easily be mistaken for a separate letter, [ma:nd] for instance being apt to be misread as [maInd]. Besides, [·] and [.] seem a convenient means of denoting full- and half-length: cp. the following section.

### 8. *Stress*

It is recommended to place stress-marks outside (not above) the letters for the sounds themselves. The best place is before the beginning of the stressed syllable, and the following signs are recommended:

['] for strong stress (full stress),  
 [₁] for half-strong (subordinate) stress,  
 weak syllables being unmarked. For extra-strong stress ["] or a heavier stroke ['] may be used.

These signs may be used for sentence stress as well as for stress within particular words.

As regards the place in which to put stress-marks, various systems were discussed and rejected by the Conference, besides that of placing some sign above the vowel-letter, which has already been mentioned. In many dictionaries and other books (chiefly popular ones) the stress-mark, generally in the form of an acute accent, is placed after the vowel of the stressed syllable: this has the inconvenience that in many cases it separates sounds that have to be pronounced closely together, as in *E. address, empty*, if transcribed [ædre's, e'mpti]; note also the difficulty with diphthongs: is *E. behind* to be written [bihaĩnd] or [biha'ind]? It is not much better to place this mark, as is sometimes done, after the whole syllable, thus [bihaind'], for it is not always easy to decide where the syllable ends, and one may hesitate between writing [em'pti], [emp'ti] and [empt'i] for *E. empty*. The best system evidently is to mark the beginning of the stressed

syllable, but this should not be done, as Sweet did in some of his early books, by placing a mark after the initial sound (he wrote, for instance, [ə'loun] for E. *alone*), as this again separates sounds that belong naturally together, but by placing the mark before the initial sound of the strong syllable, as Sweet did later and is done now by many phoneticians. The stress-mark then acts as a warning to the reader: here you have to begin a strong syllable!

The Conference, however, agreed that the system followed up to now by the Ass. Ph. of writing e. g. [ə'tempt, bi'haind] has the practical inconvenience of misleading all those who have been accustomed to the system of most dictionaries, and who will therefore be tempted to think that the acute accent means stress on the preceding vowel. Such misunderstanding is avoided by using the upright stroke, which by the very unusualness of its form warns the reader that the indication of stress is not the customary one. There are the two additional advantages that we gain a natural sign for secondary stress by placing the same small upright stroke below, as in E. *epidemic* [ˌepi'demik], and that the acute and grave accents may be utilized to indicate rising and falling tones in accordance with the shape of the signs themselves.

Note also the natural way in which the two possible pronunciations of combinations such as that of E. *at all* are indicated, the more solemn [ət'ɔːl], and the more familiar [ə'tɔːl]; cp. also *at home* [ət'həʊm, ə'thəʊm, ə'təʊm] and the similar shiftings which must have taken place in G. *allein* [al'ain, a'lain], as well as in E. *alone*, Dan. *alene*, &c.

### 9. *Tone*

The use of tones (pitch accents, 'musical' or chromatic accents, intonation) is so complicated, and presents so many divergencies from language to language, that it is impossible to devise any single system for their denotation which would be applicable to all languages. The Conference recommended that a straight line [ˉ] be used for a level tone, a slanting stroke like [ˊ] ('acute') for a rising tone, and another like [ˋ] ('grave') for a falling tone; these signs may, of course, be

combined in various ways: [^] for rising-falling, and [v] for falling-rising. Further, the place of the signs in a high, middle, or low position may be utilized, if necessary, to denote tones as high-level, mid-rise, low-level, &c., &c., and [˜] may be used for a waving tone-movement.

In spite of this general recommendation, no objection was raised to the continued use of the signs ['] and [˘] in the signification fixed by tradition among Norwegian and Swedish scholars for the two tone movements in those languages which often serve to distinguish words ('single' or 'monosyllabic', and 'compound' or 'disyllabic' tone).

#### 10. *Syllabic and Non-syllabic*

No sign for the function in a syllable is required either for a vowel used as the 'top' of a syllable (used syllabically) or for a consonant used in a non-syllabic function; but signs are often required for the opposite function.

A small round circle under the letter was unanimously adopted<sup>1</sup> to denote that a consonant acquires the syllabic function (becomes top of the syllable), e. g. [ŋ̣, ḷ]. This sign has been used by nearly every student of comparative Aryan (Indo-European) grammar, further by Lepsius, in Finno-Ugrian languages, &c., and therefore deserves being preferred to other signs sometimes used for the same function, e. g. [ŋ, ɳ, -n, 'n].

For non-syllabic function of a vowel a half-circle under the letter has similarly been used very extensively, and was adopted by the Conference, e. g. [ị, ụ].

It should be noted that in connected writing the ordinary rules of syllabification often render it unnecessary to indicate these functions expressly; thus combinations like [hidn] and [main] in English can only be read as [hiḍn] and [maɪ̣n].

#### 11. *Voice and Voicelessness*

Many of the ordinary letters imply either voice or voicelessness in the sound they usually denote: thus on the one

<sup>1</sup> Though Jones did not vote.

hand [m, n, z, a], on the other hand [s, p, h]. The Conference discussed the possibility of having one and the same sign to be used as a kind of shift-key, making what is usually voiced, voiceless, and inversely what is usually voiceless, voiced; but this idea, however ingenious, was rejected as being apt to lead to confusion. It was consequently thought advisable to devise two signs, one for turning an otherwise voiced sound into the corresponding voiceless one, and the other for the inverse change, namely

(1) [v] under the letter, e. g. [n<sub>v</sub>] for voiceless n, [l<sub>v</sub>] for voiceless l, &c., and

(2) [h] or [h̥] under the letter, thus [h̥] or [h] for voiced h.

The former sign was chosen because it might represent the position of the vocal chords when removed from one another, the latter because it gives a picture of the position of the vocal chords when approached to one another so as to make vibrations possible.

As already remarked, the sign [o] for voicelessness, e. g. in [n̥], used hitherto by the Ass. Ph., was rejected for this purpose, because it has been used extensively as a sign for syllabic function and was retained in that signification by the Conference. The digraphs [hm, hl] sometimes used for voiceless sounds may be practical in some cases, but can only be considered makeshift substitutes for signs like [n̥, l̥].

## 12. *Nasalization*

Two signs are in use for nasalization, one a wave-line above the letter as in Portuguese, e. g. [ã], and the other a hook below to the right as in Polish, e. g. [ą]. The Conference preferred the latter sign, because it was thought convenient to leave the place above letters open for indications of tone-movements, where a wave-line may be required in some languages, and for other modifications; cf. § 27 on [˙].

## 13. *Labialization and Unrounding*

For labialization (lip-rounding) the sign [w] under the letter, e. g. [n̥w, lw], was recommended: it recalls the letter *w*.

The same sign may exceptionally be applied to a vowel-

letter, though in most cases the rounded vowels have separate alphabetical signs.

For unrounding of rounded vowels the inverse sign [◌̹] may be used, e. g. [u̹].

#### 14. *Dental*

It seemed necessary to have a sign for an articulation by which the upper front teeth are really touched—dental in the strictest sense—and for this the sign [◌̪] recalling the shape of a tooth was thought appropriate, e. g. [t̪] for a stop articulated with the tip of the tongue against the teeth, distinct from the more usual alveolar [t].

#### 15. *Retroflex*

This is the best name for sounds often called cerebral, cacuminal, supradental, or inverted. They are produced by curving the tip of the tongue backwards so as to point it towards the arch of the palate.

For these consonants the Conference adopted two systems of notation as equally good, viz.

(A : monotype) [t̠ d̠ ɳ̠ ʎ̠ ʂ̠ ʐ̠].

(B : diacritics) [t̚ d̚ ɳ̚ ʎ̚ ʂ̚ ʐ̚].

The former are Lundell's signs, the latter those almost universally used by comparative linguists.

It was not considered necessary to have separate signs for the two degrees distinguished by Lundell and others in Swedish and Norwegian dialects ('supradental' and 'cacuminal'), as these variants seem never to be used as distinct phonemes in the same language: in Norwegian the former sounds occur in educated and the latter in vulgar speech in the same words and combinations.

#### 16. *Palatal*

The two classes of sounds described as palatal and palatalized, and the best ways of denoting them, were very fully discussed by the Conference, as the problems connected with these sounds bristle with difficulties.

First, as to the sounds themselves. It was considered very important indeed to distinguish as sharply as possible between the two classes of sounds, the physiological formation of which is essentially different, though in the practice of many phoneticians they are not always kept apart.

In the formation of a *palatal* sound the active organ is the upper surface ('front') of the tongue, which articulates against the hard palate, while the tip of the tongue is passive, generally lying immediately behind and touching the lower teeth. For a palatal stop there is thus contact (closure) between the hard palate and that part of the tongue which, in the state of rest, lies just beneath it, and correspondingly with the other palatals. After a long discussion, in which various possibilities of denoting this series of sounds were exhaustively reviewed, the Conference came to the conclusion that the best signs for them were monotypes (ligatures) containing a loop as in the ordinary written form of *j* (not a hook as in the printed form of the same letter), thus—[t̺ d̺ ʃ ɲ ʒ ʒ̺].

A special difficulty arises because of the similarity between the sign here used for the palatal nasal [ɲ] and the sign [ŋ] which is used by a great many scholars to denote the back sound of *E. long*, *G. lang*; but this did not seem a decisive argument against the form adopted, and the great majority of the Conference were against the form used by the Ass. Ph. [p], which reminds one too much of a common written form of *p*.

Daniel Jones raised the objection that [t̺] and [d̺] were not really modifications of [t, d], but totally independent sounds, and should not, therefore, be denoted by letters recalling [t, d]; nor could he attach any importance to the consideration which carried weight with the other members, that it was desirable to have the whole series of these sounds denoted systematically by the same modification of ordinary letters: he preferred the signs of the Ass. Ph., viz. [c ʃ ʌ ɲ ɕ ʒ̺], in spite of their unsystematic character, chiefly because they looked well in print, and had proved easy to manage in the practice of the Ass. Ph. But the other members of the Conference disapproved these signs, more particularly [ʌ] and

[c], the latter also because it seems indispensable in transliterations of foreign alphabets with the value of the affricate [ts].

It is of course possible to have similar signs framed on [k, g], as a basis for varieties lying between [ʃ, ʒ] and ordinary [k, g], namely [k̟, g̟].

### 17. *Palatalized*

Palatalization may be defined a modification (of a sound articulated elsewhere) which is produced by raising the 'front' of the tongue towards the hard palate without touching it completely. A palatalized [t] thus retains the closure formed by the tip of the tongue, while that part of the tongue which is behind the tip is raised in a manner not found in the ordinary [t]; correspondingly with other palatalized sounds. As this modification can take place with all, or most, speech sounds, the Conference did not think it advisable to have monotypes in this case, but preferred a diacritic mark which could be applied to any letter, viz.

[^], to be placed either above the letter, e. g. [ñ], or immediately after it, e. g. [n^, p^, t^]. This sign is meant to remind the reader of the palatal arch.

The Conference thus rejected various signs for palatalization : (1) an acute accent above the letter, e. g. [ñ], which can easily be mistaken for a tone mark ; (2) [v] as in [ñ], to which the same objection is applicable ; (3) ['] after the letter, as in [n', l'] : this sign must be reserved for the glottal stop ; (4) [y] after the letter, e. g. [ny, ly] : this is inexact, as it produces the impression that we have to do with two consecutive sounds instead of one single sound ; besides, this designation is objectionable on account of the ambiguity always inherent in the letter y.

On the other hand no serious objection was raised to the proposal to indicate various nicer shades of palatalization by means of a vowel-letter as index, thus e. g. [t<sup>i</sup>, t<sup>e</sup>], which seemed allowable as a substitute in some cases for [t^].

As palatal and palatalized sounds are very often confounded, the Conference thought it important expressly to ask future

investigators in each separate case clearly to indicate, by means of an unambiguous description, to which of the two classes the sounds of the language concerned belong.

### 18. *The sh-sounds*

The physiological analysis of the *sh*-sounds presents very great difficulties, and it would be well if future investigators indicated as accurately as possible the exact formation of such sounds. Two chief varieties must, in accordance with what has already been said, be denoted in the following way:

[ʃ, ʒ] if the articulation is decidedly palatal (a subdivision of dorsal articulation), and

[ʂ, ʐ] if the articulation is decidedly retroflex (with the tip of the tongue pointing upwards and backwards, a subdivision of the so-called 'coronal' articulation).

But as the acoustic effect of these two varieties is closely similar, it was thought practical by the side of these exact signs to retain the customary signs

[ʃ, ʒ] (without a loop), or, if preferred, [š, ž], to be used more loosely as a kind of non-committal signs, where a writer is not quite clear as to the exact method of formation, or where the sound is neither pronouncedly palatal nor retroflex, though possessing the same hollow character which distinguishes the 'hush-sounds' from 'hiss-sounds'.

### 19. *Fricatives (Spirants)*

In order to get a consistent system of signs for this important class of sounds, the Conference recommended the use of Greek letters as follows:

[φ, β] for bilabial sounds. (Instead of the Greek form φ, the Russian form ф may be used by those who are afraid of φ being mistaken for ø).

[θ, ð] for point (dental) sounds. (The shape of the latter with a straight stroke above, ð, is preferred to δ).

[χ, γ] for velar (postpalatal) sounds. (The letter x may be used instead of χ).



The Conference thus pronounced against the use of crossed letters like [ḅ, ḁ], which have often been used, but which cannot be made into a comprehensive system : a crossed p and t for the sounds here denoted [ϕ, θ] seemed impossible, and a crossed printed g is not good on account of the usual shape of that letter, though [ǵ] is not so bad. The use of the two signs [ð, θ], as in the Ass. Ph., did not find favour, partly because one of the corresponding signs was taken from Old Norse (Old English), the other from Greek, partly because the sign [θ] for the voiceless sound seemed inferior to the other Greek form θ, because it reminded one rather of a vowel-sign like ø.

For the labio-dental fricatives the ordinary Latin letters [f, v] were adopted as a matter of course. Similarly there could be no doubt with regard to

[w] for the rounded bilabial voiced fricative with raising of the back of the tongue, as in E. *we*. The corresponding voiceless sound can, of course, be written [w̥] (§ 11), but it was thought convenient also to have the widely used sign

[hw] for this sound.

For the palatal (prepalatal) voiced consonant the letter [j] without the dot was adopted (cf. above, p. 12, on the ambiguity of the letter j with a dot, and § 10 on the relation between the real consonantal [j] and non-syllabic [i̯]). For the voiceless consonant corresponding to [j] (G. *ch* in *ich*) no sign was provided in the deliberations of the Conference ; but the sign [x̥] seems convenient, as the consonant may be looked upon as a kind of palatal [x].

## 20. *Velar*

With regard to [k] and [g] there can be no doubt, but it is not easy to settle the matter for the corresponding nasal. The Conference pronounced in favour of the sign [ŋ], because it allows subsidiary marks above and below the line better than the other signs [ŋ̥, ŋ̥̥, ŋ̥̥̥], which otherwise seem unobjectionable and equally employable. All these forms are in use, and may be considered variants of the same letter.

21. *Post-velar*

For the post-velar consonants, articulated against the lower part of the soft palate (and the uvula), a consistent system of signs is obtained by the use of small capitals, thus

[K, G, N, R], and Greek capital letters for fricatives [X, Γ]; [q] however was admitted as an alternative to [K].

In the same way [L] may be used for a side-consonant (lateral) in which the back of the tongue articulates against the soft palate without the tip of the tongue being at all active. This is different from the ordinary 'hollow l', produced with the tip of the tongue in the usual place for the ordinary [l], from which it differs by having a greater distance between the sides of the tongue and the cheeks, and by a hollow in the front part of the tongue, which necessitates the raising of the back of the tongue, and thus produces an [u]-like resonance; this 'hollow l' may be written [ɭ].

22. *Glottal (Laryngeal)*

The following signs were adopted:

[ʔ] glottal stop ('fester Einsatz').

[h] and [ʰ], two degrees of h-sounds; [th] strongly and [tʰ] weakly aspirated [t].

[h̥] or [h̩], voiced h, see above, § 11.

[ħ], the Semitic h with strong pressure.

[ʕ], Arabic ain.

23. *R-sounds*

It seemed impracticable to provide separate signs for all variants found in existing languages, but the following were recognized as the main types:

[r], point-r, generally with trill; it is of course possible to denote variants by means of diacritics, [ɽ] retroflex, [r̥] or [r̩] palatalized.

[ř], the Čech sibilant r-sound.

[ɻ] (printed forms [ʁ, ɹ]), various r-sounds in the back of

the mouth, but if the sound is distinctly post-velar (uvular) the letter [R] should be used in accordance with the recommendation in § 21.

#### 24. *Affricates*

In most cases simple combinations of two letters will be sufficient, e.g. [ts]; but where the joining is particularly close, so that the ear may hesitate between the impression of one sound and of two sounds, it will be convenient to have the two letters joined into one type, e.g. [tʃ]. It may often be practical to write, e.g., [tʃ] or [tʃ̥] instead of the physiologically more exact notation with joined [tʃ̥] or [tʃ̥̥].

#### 25. *Non-exploded stops*

Non-exploded stops should be denoted by adding a small square above after the consonant sign, e.g. [t<sup>◻</sup>].

#### 26. *Clicks*

Clicks should be denoted by adding a small triangle to the letter for the corresponding ordinary sound, e.g. [t<sup>△</sup>] or [t<sup>▲</sup>].

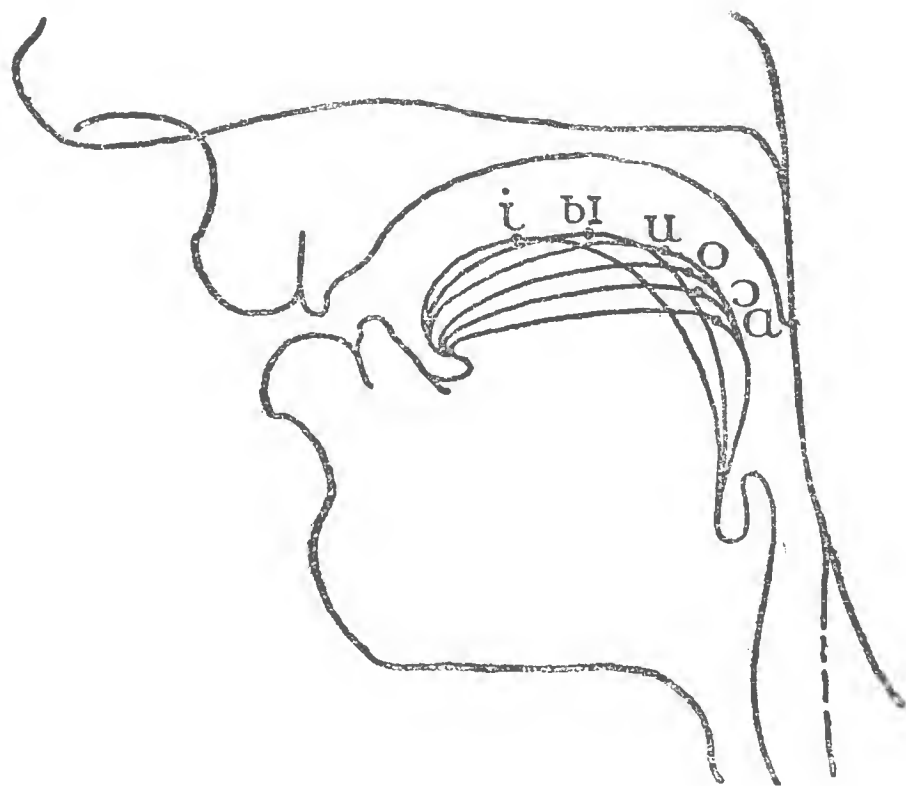
The signs used by Lepsius and others (c, q, x, ||, !, +, ⊙) are quite unsystematic, and must be rejected.

#### 27. *Vowels*

The notation of vowels proved one of the most difficult tasks of the Conference, because languages differ very much from one another, and small nuances in articulation, which in one language are utterly unimportant, may in other languages be distinctive. It is also in the present stage of phonetic science very difficult, not to say impossible, to give objective descriptions of vowels which are sufficiently precise to ensure an exact recognition of the vowel intended. Much must, accordingly, be left to future research and to each individual investigator.

Daniel Jones explained to the Conference his system of

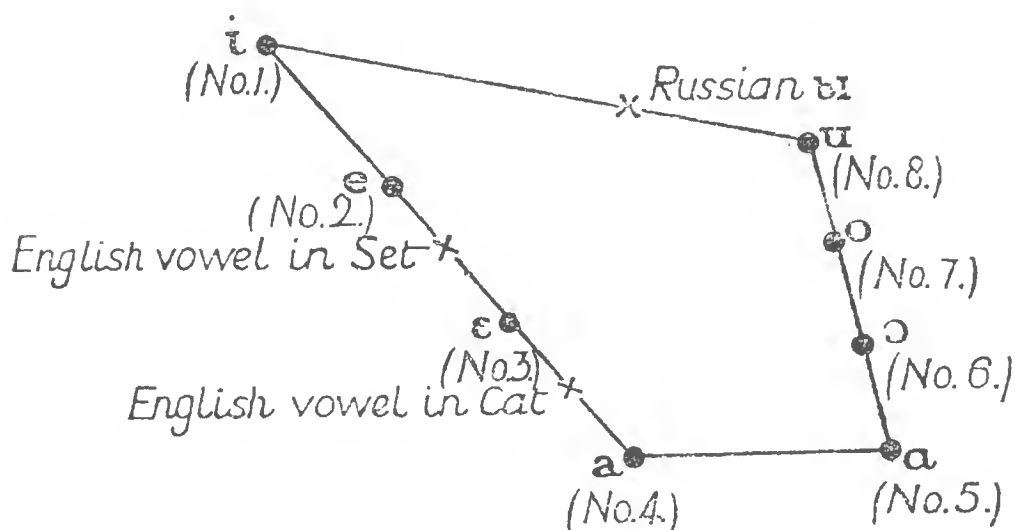
'Cardinal Vowels', in which he has aimed at fixing a certain number of vowel articulations, which may be used as starting-points for descriptions of any vowel-sounds actually occurring in various languages. These cardinal vowels are not chosen arbitrarily from definite languages, but they are selected on physiological and acoustic grounds. Cardinal vowel No. 1 (i) is the vowel which has the tongue in the highest and most forward position. Cardinal vowel No. 5 (a) has the tongue in the lowest and most backward position. Cardinal vowels 2 (e), 3 (ɛ), and 4 (æ) are selected as being three front vowels such that the degrees of acoustic separation between each pair of consecutive vowels are approximately equal. Cardinal vowels 6 (ɔ), 7 (o) and 8 (u) are back vowels with lip-rounding, chosen so as to continue the series of equal degrees of acoustic separation. Cardinal vowel No. 8 (u) is not determined by any physiological consideration, as will be seen from the following diagram :



The tongue positions of cardinal vowels 1, 4, 5, and 8 have been established by means of X-ray photographs, and if a dot be placed to represent the highest point of the tongue in each

case these dots will be found to be geometrically related approximately as follows :

For the purpose of practical language study, it is convenient to join these points by straight lines, and place the remaining cardinal points between [i] and [a], and [a] and [u], as shown in the following diagram :



Any one who knows the cardinal vowels can obtain a very good idea of the sound of a foreign vowel if he sees the dot corresponding to it placed on the appropriate spot on the diagram, and has also instructions as to the position of the lips. Thus, a foreign learner who knows the cardinal vowels can get a very good idea of the sound of the English vowels in 'set' and 'cat' if he knows that the first is approximately half-way between cardinal vowels 2 and 3, and the second is

approximately half-way between cardinal vowels 3 and 4. Similarly it is possible for an Englishman wishing to learn the Russian *и* to know that the normal value (without a following 'soft' consonant) is about two-thirds of the way from cardinal vowel No. 1 (*i*) to cardinal vowel No. 8 pronounced with unrounded lips. (See above diagram.)

This system was criticized by some members who thought that it was not sufficient to have two intermediate points between the highest and the lowest vowels, as some languages (Swedish, Chinese, &c.) distinguished three stages (Sw. *se*, *hjälm*, *bära*, and correspondingly in the *o*- and *ö*-series).

The Conference left the use of monotype vowel-letters, such as those of the Ass. Ph., free as optional denotations of vowels, among these [ʌ] for E. *u* in *cut*. But the use of [a] and [ɑ] for distinct vowels was criticized on the score that compositors and others were accustomed to look upon a as the printed (Roman) form corresponding to the written form *α*, and that the latter shape was also used as the italic ('kursiv') form of *a*, without any separate significative meaning being attached to it.

But by the side of such monotype letters for vowels it was thought indispensable to have diacritic marks for two modifications, viz. advancing from a back position towards a front position (thus for a horizontal movement), and for close and open varieties (thus a vertical or up-and-down movement); cp. also the diacritics for lip-rounding and unrounding, above, § 13.

For advanced vowels the use of one or two dots above the letter was adopted, one dot being used for the central (mixed) vowels, and two for the front vowels in the rounded series, thus

[ù] for the high-mixed-round vowel (the two varieties in Swedish and Norwegian *hus* were not provided with separate signs), and

[ü] for the high-front-round vowel in Fr. *bu*, G. *über*. By this use of the letter [ü] the ambiguous letter [y] may be avoided; cf. above, p. 12.

By a consistent use of these two diacritics we have the two series :

Central :

ü

ö

õ

Front :

ü

ö

õ

and correspondingly for the not-round vowels

ä

ä

To the signs ı ı after the letter for advanced and retracted positions it was objected that it is difficult to remember which is to mean advanced and which retracted, and that in print these signs often look as separate letters for whole sounds. The same objection applies to ʞ ʞ for lowered and raised positions.

The signs thus adopted provide for the most important classes of vowels, with the exception of the not-round central (mixed) vowels, which cannot be denoted in the same way as the corresponding round vowels by means of the dot indicating advanced articulation, as no single letters are found for not-round back vowels. For the high vowel of this series no better sign was found than the Russian [ы], as neither ĭ (in which the two dots must then be taken in the directly opposite meaning to that of ü), nor ı (ı turned upside down), nor ʞ or ʞ were thought particularly good, for various reasons. For the mid-central vowel the sign [ə] is used almost universally, though not always for exactly the same vowel-sound—it may be used with a certain latitude for sounds nearly in the centre of the vowel-system—and correspondingly [ɐ] (e turned upside down) may be used for the low-central vowel, thus giving the series :

ы

ə

ɐ

For vertical varieties two systems of diacritic marks under the letter were recommended without the Conference taking definitely sides for either of them, namely :

(1) the old Lepsius system [.] for close, and [-] for open articulation. The dot is used in the same signification in Romanic philology, where the open variety is indicated by a hook [ç]—which has too close a similarity to the sign which the Conference adopted for nasalization (§ 12)—and

(2) a new system [<] for close and [>] for open articulation. In favour of these signs it was mentioned that the signs are used in their mathematical signification, [<] meaning less, and [>] more aperture than in the unmodified letter.

Some members of the Conference objected to the use of the dot as above in the Lepsius system, that the same sign had already been employed with consonant letters for the retroflex articulation, and that there might be use for the same sign with the same value for vowels articulated with the tip of the tongue pointing upwards (sometimes written, e. g., [aʳ] or [á]). But other members did not attach much importance to that objection, and thus the choice was left open between

[ė] and [ë] for 'close e',

[ẹ] and [e̤] for 'open e', &c.

## 28. *Arrangement of Tables of Sounds*

It was unanimously agreed that it was preferable to arrange tables of sounds with the labial consonants, front vowels, &c., on the left-hand side, and the sounds formed in the back of the mouth on the right-hand side.

## 29. *The Transliteration of Non-Latin Writing*

For the transliteration of non-Latin writing, linguists are recommended to conform, as far as possible, to the system of phonetic script adopted by the Conference. Linguists are also specially recommended to use this system as a basis in cases where the introduction of any new sign is involved.

Of course it should not be forgotten that the choice of signs for the transliteration will be frequently determined by non-phonetic considerations. Thus, in the transliteration of the writing of imperfectly known languages, in which the alphabet



is derived from the Greek alphabet, one must often be guided by the alphabetic identity. For this reason the Lycian, Etruscan, Oscan, and Umbrian sign corresponding to the Greek ζ is often transcribed by *z* although it indicates in all these languages an affricate [ts] and not a [z]; and one transcribes in the same way the corresponding sign of Venetian, which represents a pronunciation [d] or perhaps [ð]. An analogous procedure may perhaps even be natural in cases where an alphabet of non-Greek origin is concerned. Thus it is known that Sieg and Siegling in transcribing Tokharian (the writing of which originates from the Indian alphabet) have taken particular care to indicate without ambiguity the alphabetic correspondence (*wa*, *ka*—[wə], [kə]). And what strikes one particularly is that in transcribing the less known languages which employed the Assyrio-Babylonian cuneiform writing (Elamite, Vannic, Mitanni, Hittite, &c.) the most prudent course is to follow mechanically the transcriptions in use for Assyrio-Babylonian, without any phonetic interpretation. Thus, one will write in Hittite *za*, *zi*, &c., without regard to the fact that the Hittites doubtless pronounced them [tsa], [tsi], &c.

Similar reasons have determined the uniform transcription *č* for the Russian ч and the Serbian ч, in spite of the considerable difference in pronunciation. In this case there is, combined with alphabetic considerations, the wish to indicate etymologically identical sounds in the same form, a wish that may even be legitimate in many other cases, when it is a question of making a phonetic rather than a historical comparison of languages.

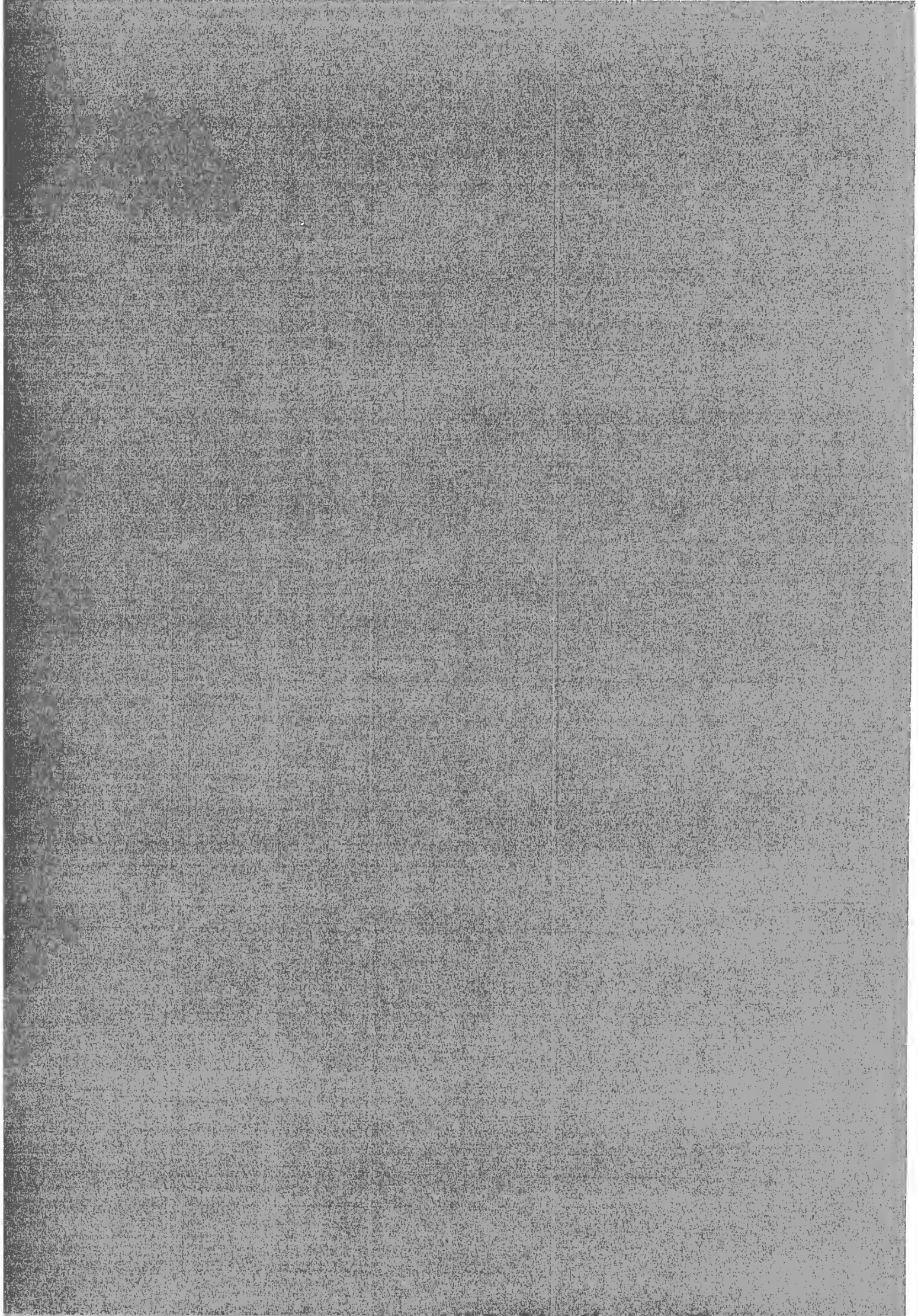
Finally, the general rule for transcription will always be, in normal cases, to render a given letter of the original writing in one way only. This rule will, however, bring about many phonetic inexactitudes, the avoidance of which should not be attempted. Thus, one uniformly transcribes by *b*, *d*, *g* the Gothic occlusives and spirants, &c.<sup>1</sup>

<sup>1</sup> In all the above, I am speaking of ordinary transcription, of which the sole purpose is to replace the original script. If, however, for any special reason, it is desired to indicate the exact phonetic value of these

Apart, however, from all the circumstances which can legitimately bring about a non-phonetic transliteration, it is hoped that transliteration will be more and more influenced by the system of phonetic script adopted by the Conference. Transcriptions up to the present regarded as usual may be provisionally permitted, which, without being in accordance with the system, are not in direct conflict with the recommended signs. Thus one may quite well provisionally permit the traditional transcription of Sanskrit (as found in the Grammar of Wackernagel, or with the *ç*, preferred by French linguists to the *ś*, or with other small variations), and one may accept the usual transcriptions of the Slavonic languages, using the Cyrillic alphabet. On the other hand, signs directly in conflict with the phonetic system adopted by the Conference should be avoided. Thus one should not transcribe the Semitic emphatics by *t*, *d*, &c., these letters having quite another significance in the system of the Conference (but one may of course employ, without coming into conflict with our system, most of the other transcriptions hitherto used in transcribing Semitic languages).

The toleration now recommended will have the result that divergences of transcription between the different systems will only disappear gradually. It is hoped, however, that they will finally be abolished, and that the system of phonetic script adopted by the Conference will contribute to this desirable result.

non-phonetic transcriptions or of the original writing, it is recommended that the system of phonetic script adopted by the Conference be made use of.



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